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(FILE 'HOME' ENTERED AT 16:54:47 ON 10 DEC 2001)

FILE 'REGISTRY' ENTERED AT 16:54:55 ON 10 DEC 2001

L1 11 (3<NI<5 AND .5<SI<1 AND 0<MG<.5 AND 0<SN<2 AND .2<ZN<2 AND 50<C

FILE 'HCA' ENTERED AT 16:55:55 ON 10 DEC 2001

L2 10 L1

L3 3363 (NICKEL OR NI) AND (SILICON OR SI) AND (MAGNESIUM OR MG) AND (T

L4 10 L2 AND L3

SELECT IPC L4 1-10

L5 320117 E1-15

L6 1125 L5 AND GRAIN AND TENSIL?

L7 28 L6 AND L3

L8 27 L7 NOT L4

FILE 'REGISTRY' ENTERED AT 17:15:25 ON 10 DEC 2001

L9 3961 (0<ZN<2 AND 50<CU)/MAC

FILE 'HCA' ENTERED AT 17:15:41 ON 10 DEC 2001

L10 96 L5 AND L9 AND L3 AND (HIGH(2A)(TENSIL? OR STRENGTH))

L11 92 L10 NOT L8

AN 116:179230 HCA  
TI Manufacture of **copper** alloy sheets having high strength,  
electric conductivity, and bendability

IN Hirano, Yasuo

PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 6 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03188247	A2	19910816	JP 1989-322703	19891214

AB An ingot of **Cu** alloy contg. **Ni** 0.4-4.0, **Si**  
0.1-1.0, and **Sn** 0.1-3.5% with **Ni** + **Si** +  
**Sn** <5.0% is soln. treated at .gtoreq.700.degree. for **grain**  
size 1-10 .mu.m, cold processed for draft <40%, and aged at  
300-700.degree.. The **Cu** alloy, useful for elec. devices,  
optionally contains 0.001-2.0% **Fe**, **Mg**, **Al**, **Cr**, **Mn**, **Co**,  
**Zn**, **Ti**, **Zr**, **Pb**, **Cd**, **In**, **Ag**, and/or **P**. Thus, a **Cu** alloy  
(contg. **Ni** 1.6, **Si** 0.4, and **Sn** 0.5%) manufd.  
according to the invention had **tensile** strength 63 kg/mm<sup>2</sup>,  
elongation 14%, good bendability, and elec. cond. 35% of **Cu** std.

AN 120:83730 HCA

TI Copper-composite parts for vibration dampers

IN Asai, Masato

PA Furukawa Electric Co Ltd, Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 05222467	A2	19930831	JP 1992-58930	19920212
AB	The parts used in bending are manufd. the Cu-alloy composites reinforced with aramid fibers and/or carbon fibers. The Cu alloys showing good strength, stress relaxation, and corrosion resistance contain Ni 1.2-3.6, Si 0.3-1.0, Be 0.2-2.5, Ti 0.2-4.5, Sn 0.1-3.5, Co 0.1-2.5, Zn 0.1-5.0, and/or Mg 0.05-0.5%.				

AN 127:361652 HCA  
TI Copper alloys having good discharge wear resistance for electric contacts

IN Ogura, Tetsuzo

PA Kobe Steel, Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 09263864	A2	19971007	JP 1996-97785	19960326
AB	Claimed Cu alloys contain 0.1-1.0 wt.% Si. Also claimed are Cu alloys contg. 0.1-1.0 wt.% Si and 0.01-6.0 wt.% (as total) of metals selected from Mg 0.01-1.0, Al 0.01-1.0, Ti 0.01-1.0, Cr 0.01-1.5, Mn 0.01-1.0, Fe 0.01-3.0, Co 0.01-3.0, Ni 0.01-4.0, Zn 0.01-5.0, Zr 0.01-1.0, Ag 0.01-1.0, and/or Sn 0.01-2.0 wt.%.				

AN 116:49773 HCA  
TI **Copper** alloy with good elastic characteristics and mechanical strength for migration-resistant electric terminal and connector  
IN Miyato, Motohisa; Hosokawa, Isao  
PA Kobe Steel, Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 6 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03226536	A2	19911007	JP 1990-19719	19900130
	JP 2977845	B2	19991115		

AB The **Cu** alloy contains **Ni** 0.4-4.0, **Si** 0.1-1.0, **Zn** 1.0-5.0 (.noteq.1.0), **Mg** 0.05-0.5, **Sn** 0.1-0.5, **Cr**, **Ti**, and/or **Zr** 0.001-0.10 (.noteq.0.01) wt.%.

AN 2002:90278 HCAPLUS  
DN 136:121833  
TI Copper alloy for electronic or electric equipment parts  
IN Usami, Takayuki; Hirai, Takao  
PA The Furukawa Electric Co., Ltd., Japan  
SO PCT Int. Appl., 38 pp.  
CODEN: PIXXD2  
DT Patent  
LA Japanese  
FAN.CNT 2

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	WO 2002008479	A1	20020131	WO 2001-JP4351	20010524
	W: CN, KR, US				
	RW: DE, FI, FR, IT				
	JP 2002038228	A2	20020206	JP 2000-224425	20000725
	EP 1325964	A1	20030709	EP 2001-934329	20010524
	R: DE, FR, IT, FI				
	US 2002127133	A1	20020912	US 2001-5880	20011102
	US 2003165708	A1	20030904	US 2003-354151	20030130
PRAI	JP 2000-224425	A	20000725		
	WO 2001-JP4351	W	20010524		
	US 2001-5880	A2	20011102		

AB The copper alloy for electronic or elec. equipment parts comprises 1.0-3.0 Ni, 0.2-0.7 Si, 0.01-0.2 Mg, 0.05-1.5 Sn, 0.2-1.5Zn and <0.005% S. The alloy has a specific crystal grain diam. and a specific ratio of the longer diam. of a grain in a cross section parallel with the direction of a last plastic working to the longer diam. of a grain in a cross section perpendicular to the direction of the last plastic working, and/or a sp. surface roughness after the last plastic working.

RE.CNT 5 THERE ARE 5 CITED REFERENCES AVAILABLE FOR THIS RECORD  
ALL CITATIONS AVAILABLE IN THE RE FORMAT

AN 131:192767 HCA  
TI Copper alloys for electric conductive springs  
IN Hirai, Takao; Usami, Takayuki; Yoshida, Koichi; Oyama, Yoshimasa  
PA Furukawa Electric Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 13 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11222641	A2	19990817	JP 1998-33628	19980130

AB The Cu alloys contain Ni 1.0-3.5, Si 0.2-0.9, Mg 0.01-0.20, Sn 0.05-1.5, and optionally Zn 0.2-1.5 wt.% (S and O are suppressed to <0.005 wt.%, for each), and have crystal grain size .gtoreq.1 .mu.m and .ltoreq.25 .mu.m. The Cu alloys may further contain (A) .gtoreq.1 selected from Ag 0.005-0.3, Mn 0.01-0.5, Fe 0.005-0.2, Cr 0.005-0.2, Co 0.05-2.0, and P 0.005-2.0, and/or (B) Pb 0.005-0.1 and/or Bi 0.005-0.03 wt.%. Prepn. of the Cu alloys involves (1) cold working, (2) recrystg. at 700-920.degree., and optionally (3) aging at 420-550.degree., and (4) cold working by .ltoreq.25% draft, and (5) low-temp. annealing. In the prepn., cold working by .ltoreq.25% draft may be carried out after 2. The alloys show excellent mech. properties, elec. cond., stress-release performance, and bending formability.

AN 119:144571 HCA  
TI **Copper** alloy trolley wires  
IN Eguchi, Tatsuhiko; Asai, Masato; Shinozaki, Shigeo; Ooyama, Yoshimasa  
PA Furukawa Electric Co Ltd, Japan  
SO Jpn. Kokai Tokkyo Koho, 4 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
	-----	-----	-----	-----	-----	
PI	JP 05125469	A2	19930521	JP 1991-319990	19911106	
AB	The wires contain <b>Ni</b> 1.0-4.0, <b>Si</b> 0.3-1.0, and optionally <b>Ag</b> 0.01-1.0, <b>Mg</b> 0.01-1.0, <b>Zn</b> 0.01-1.0, <b>Fe</b> 0.01-0.5, <b>Mn</b> 0.01-0.5, and/or <b>Sn</b> 0.01-0.5%. The wires have high elec. cond. and strength, and excellent wear and heat resistance.					

AN 131:192767 HCA

TI Copper alloys for electric conductive springs

IN Hirai, Takao; Usami, Takayuki; Yoshida, Koichi; Oyama, Yoshimasa

PA Furukawa Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 13 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 11222641	A2	19990817	JP 1998-33628	19980130
AB	The Cu alloys contain Ni 1.0-3.5, Si 0.2-0.9, Mg 0.01-0.20, Sn 0.05-1.5, and optionally Zn 0.2-1.5 wt.% (S and O are suppressed to <0.005 wt.%, for each), and have crystal grain size $\geq 1 \mu\text{m}$ and $\leq 25 \mu\text{m}$ . The Cu alloys may further contain (A) $\leq 1$ selected from Ag 0.005-0.3, Mn 0.01-0.5, Fe 0.005-0.2, Cr 0.005-0.2, Co 0.05-2.0, and P 0.005-2.0, and/or (B) Pb 0.005-0.1 and/or Bi 0.005-0.03 wt.%. Prepn. of the Cu alloys involves (1) cold working, (2) recrystg. at 700-920.degree., and optionally (3) aging at 420-550.degree., and (4) cold working by $\leq 25\%$ draft, and (5) low-temp. annealing. In the prepn., cold working by $\leq 25\%$ draft may be carried out after 2. The alloys show excellent mech. properties, elec. cond., stress-release performance, and bending formability.				

AN 116:199114 HCA  
TI Low-strength **copper** alloy material having fine **grains**  
IN Toe, Tamio  
PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 03193849	A2	19910823	JP 1989-331286	19891222
AB	The <b>Cu</b> alloy contg. 3-25% <b>Zn</b> and 0.005-2.0% optional Pb, Fe, Sn, Al, Mn, Ni, P, As, Ti, Cr, Co, Zr, V, Be, Cd, Si, B, In, Ti, <b>Mg</b> , Hf, and/or Ge is cold-rolled for .gtoreq. 75% draft, finish annealed for < 0.015 mm in <b>grain</b> size, and cold-rolled in option for 1-15% draft to induce a fine-grained texture for easy forming into heat exchangers. The cold-rolled product shows <b>tensile</b> strength 33.0-40.3 kg/mm <sup>2</sup> , elongation 36.4-41.0%, Ericksen value 12.4-13.3 mm, and <b>grain</b> size 0.003-0.010 mm.				

AN 115:13739 HCA  
TI Manufacture of **copper** alloy strip having deep drawability and  
machinability

IN So, Hidehiko

PA Nippon Mining Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02170955	A2	19900702	JP 1988-321883	19881222

AB The **Cu** alloys contg. **Ni** 7-25, **Zn** 5-32, and  
optionally **P**, **Sn**, **Si**, **Mg**, **Ti**, **Cr**, **Zr**, **Al**,  
**Fe**, **Pb**, **Mn**, and/or **Co** 0.001-5% are cold rolled at .gtoreq.35% draft,  
annealed in the 1st stage to give a microsructure having the max./min.  
**grain** size ratio .ltoreq.2, further cold-rolled at .gtoreq.35%  
redn., annealed in the 2nd stage for av. **grain** size of 2-10 um,  
and finished by stress-relief annealing to manuf. high-strength strip for  
elec. connectors. Thus, the **Cu** alloy (contg. **Ni** 18,  
**Zn** 18, **Ti** 0.50, and **Si** 0.32%) was cold rolled at 50%  
draft, annealed in the 1st stage to give the ratio of 1.3, further cold  
rolled at 60% draft, annealed in the 2nd stage to give av. **grain**  
size of 4 .mu.m, and then annealed to manuf. the strip with  
**tensile** strength 70.4 kg/mm<sup>2</sup>, elongation 6.9%, and Vickers  
hardness 214.

AN 115:62613 HCA  
TI Copper alloys for lead frames of semiconductor devices  
IN Kazama, Keizo; Shimizu, Yuichi; Osako, Toshiyuki  
PA Sumitomo Metal Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
	-----	-----	-----	-----	-----
PI	JP 02200747	A2	19900809	JP 1989-17581	19890130

AB A Cu alloy for a lead frame of a semiconductor device contains Ni 1-4, Si 0.2-1, V 0.01-0.1, Zn 0.05-1, and optionally Sn 0.1-3 and/or Mg 0.01-1 wt.% and has high strength, elec. cond., hot- and cold-workability, high adhesion strength of coatings, solderability, etc.

AN 115:13645 HCA  
TI **Copper** alloy for polished dies in forming of plastics  
IN Nakayama, Hiroaki; Iwamura, Takuro  
PA Mitsubishi Metal Corp., Japan  
SO Jpn. Kokai Tokkyo Koho, 11 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 02194139	A2	19900731	JP 1989-11538	19890120
	JP 2629332	B2	19970709		

AB The **Cu** alloy for easy mirror finishing and **high-strength** dies resistant to corrosion contains **Ni** 2.0-6.5, **Ti** 0.7-3.3, **Cr** 0.1-1.5, **Si** 0.001-0.1, and optionally **Zr** 0.001-0.5, **Co** 0.001-0.5, **Fe** 0.001-0.5, **Sn** 0.05-1.2, **Mn** 0.05-1.2, **Zn** 0.05-1.2, **Mg** 0.001-0.2%, **P** 0.001-0.2%, and rare-earth metals 0.001-0.2%. The **Cu** alloy typically shows tensile strength of 63.4-73.9 kg/mm<sup>2</sup>, Vickers hardness 235-261, and elec. cond. 47.9-57.0% of **Cu** std.

AN 110:241152 HCA

TI **Copper** alloys for electric apparatus parts

IN Asai, Masato; Terashita, Michiaki; Oyama, Yoshimasa

PA Furukawa Electric Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 5 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 63274729	A2	19881111	JP 1987-106931	19870430
	JP 04040417	B4	19920702		

AB The title Cu alloys contain **Sn** 2.0-8.0, **Ni** 3.5-10.0, **Si** 0.6-5.0, .gtoreq.1 of Cr, Mn, Ti, Al, and Fe 0.03-2.0 in total, and optionally .gtoreq.1 of Ag, **Mg**, Ca, misch metal, Te, B, Nb, In, V, La, Y .ltoreq.0.2 each, Be, Zr, **Zn**, Co, and Cd .ltoreq.1.5 wt.% each and .ltoreq.1.5 wt.% in total and impurity concns. P .ltoreq.500 ppm, S .ltoreq.10 ppm, and O .ltoreq.50 ppm. The alloys have **high strength**, processibility, elec. and thermal cond., heat and corrosion resistance, and are useful for semiconductor leads, connectors, switches, etc.

AN 116:26123 HCA  
TI Manufacture of **copper** alloy strip for radiator plates  
IN Toe, Tamio  
PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
	-----	-----	-----	-----	-----	
PI	JP 03087326	A2	19910412	JP 1989-221524	19890830	
AB	Cold-rolled strip is manufd. from ingot slabs of the <b>Cu</b> alloys contg. <b>Zn</b> 1-5, <b>Sn</b> 0.01-3, and optionally <b>Ni</b> 0.1-5, <b>Si</b> 0.01-2, and <b>Al</b> , <b>Fe</b> , <b>Pb</b> , <b>As</b> , <b>Sb</b> , <b>B</b> , <b>Co</b> , <b>Cr</b> , <b>Mn</b> , <b>Te</b> , <b>In</b> , <b>Ti</b> , <b>Zr</b> , <b>Hf</b> , <b>Be</b> , <b>Mg</b> , <b>Ag</b> , <b>Cd</b> , and/or <b>Ge</b> 0.001-2%. The strip is then annealed and finish rolled at 3-20% draft for the product with grain size $l \leq 0.15 \mu\text{m}$ as well as high stress-corrosion crack resistance, strength, formability, and paint adhesion. Thus, the strip from <b>Cu-4.2 Zn-1.0% Sn</b> alloy having grain size of 10 $\mu\text{m}$ after cold rolling and annealing showed tensile strength of 31.2 kg/mm <sup>2</sup> and elongation 55.3%.					

AN 109:195637 HCA

TI **Copper** alloy sheet of high strength and electric conductivity,  
and its manufacture

IN Tsuji, Masahiro; So, Hidehiko  
PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 63130752	A2	19880602	JP 1986-275155	19861120
AB	The high-strength <b>Cu</b> alloy sheet is manufd. for integrated-circuit leads. The <b>Cu</b> alloy contains <b>Ni</b> <b>0.4-4.0</b> , <b>Si</b> <b>0.1-1.0</b> , and optionally <b>P</b> , <b>As</b> , <b>Sb</b> , <b>Fe</b> , <b>Co</b> , <b>Cr</b> , <b>Sn</b> , <b>Al</b> , <b>Ti</b> , <b>Zr</b> , <b>Hf</b> , <b>Mg</b> , <b>Be</b> , <b>Zn</b> , and/or <b>Mn</b> <b>0.01-1.0</b> each for total <b>0.01-0.2%</b> . The <b>Cu</b> alloy is aged <b>1-20 h</b> at <b>300-600.degree.</b> , cold rolled for <b>.gtoreq.30%</b> draft, and then stress-relief annealed. Thus, an ingot of <b>Cu</b> alloy contg. <b>Ni 1.6</b> , <b>Si 0.4</b> , <b>Zn 0.4</b> , and <b>O 0.0006%</b> was hot rolled at <b>apprx.800.degree.</b> to <b>7.5 mm</b> , trimmed, cold rolled to <b>1.5 mm</b> , annealed to have a <b>grain size of .ltoreq.10 .mu.m</b> , finish rolled to <b>0.8 mm</b> , and heat treated <b>6 h</b> at <b>420.degree..</b> The sheet was cold rolled and then stress relieved <b>0.5 min</b> at <b>500.degree.</b> to obtain a product showing <b>tensile strength 69.5 kg/mm<sup>2</sup></b> , <b>elongation 6%</b> , and <b>elec.</b> <b>cond. (% IACS) 53</b> , vs. <b>68.9 kg/mm<sup>2</sup></b> , <b>10%</b> , and <b>4</b> for <b>Fe-42% Ni</b> alloy.				

AN 116:89249 HCA  
TI High-strength phosphor bronze  
IN Hirano, Yasuo; So, Hidehiko  
PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 5 pp.  
CODEN: JKXXAF

DT Patent  
LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE	
PI	JP 03104845	A2	19910501	JP 1989-240250	19890918	
AB	The bronze contains <b>Sn</b> 0.5-3.5, <b>P</b> 0.001-0.3, <b>Ni</b> 0.01-0.5, and optionally <b>Fe</b> , <b>Mg</b> , <b>Al</b> , <b>Si</b> , <b>Cr</b> , <b>Mn</b> , <b>Co</b> , <b>Zn</b> , <b>Ti</b> , <b>Zr</b> , and/or <b>Pb</b> 0.001-2%. The bronze is annealed at 150-650.degree. for grain size of 0.001-0.025 mm and pptn. of <b>Ni</b> phosphide, and cold rolled at <90% draft. Thus, a bronze contg. <b>Sn</b> 2.0, <b>P</b> 0.05, and <b>Ni</b> 0.3% was annealed at 350.degree. and cold rolled at 50% draft to 0.25 mm. The manufd. bronze strips had tensile strength 60 kg/mm <sup>2</sup> , elongation 12%, and IACS elec. cond. 30%, vs. 54 kg/mm <sup>2</sup> , 15%, and 28% for similar strips of <b>Cu</b> alloy contg. 2% <b>Sn</b> and 0.05% <b>P</b> .					

AN 99:199350 HCA

TI **Copper** alloys for semiconductor device lead wires

PA Nippon Mining Co., Ltd., Japan

SO Jpn. Kokai Tokkyo Koho, 4 pp.

CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 58123846	A2	19830723	JP 1982-6063	19820120
	JP 60045698	B4	19851011		

AB The **Cu** alloys contain **Ni** 0.4-4.0, **Si**

0.1-1.0%, O .1toreq.10 ppm, and optionally .gtoreq.1 P, As, Sb 0.001-0.1 each, Fe, Co, Cr, **Sn**, Al, Ti, Zr, **Mg**, Be, **Zn**, and Mn 0.01-1.0 each, but totalling 0.001-2.0%. The **grain size** is .1toreq.5 .mu. diam. Thus, a 100 mm thick ingot was rolled at 800.degree. to 7.5 mm, scalped, cold rolled to 1.5 mm, annealed at 800.degree. for 5 min, cold rolled to 0.8 mm, and heated 6 h at 420.degree.. The **Cu** alloy [87781-33-7] sheet contg. **Ni** 1.60, **Si** 0.40%, and O 6 ppm with **grain size** of 2 .mu. had satisfactory solderability, no swelling after 5 .mu. thick Ag plating and heating 5 min at 35.degree., **tensile** strength 68.0 kg/mm<sup>2</sup>, and elongation 13.0%. Comparable values for the **Cu** alloy having a 7 .mu. **grain size** were satisfactory, swelling, 45.0 kg/mm<sup>2</sup>, and 21.2%.

AN 111:11181 HCA  
TI Manufacture of **high-strength copper** alloy  
material

IN Asai, Masato; Oyama, Yoshimasa; Terashita, Michiaki; Shiga, Shoji  
PA Furukawa Electric Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 7 pp.  
CODEN: JKXXAF

DT Patent

LA Japanese

FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 63266049	A2	19881102	JP 1987-101401	19870424
	JP 2555067	B2	19961120		

AB The **high-strength** material for elec. and electronic parts is manufd. from the Cu alloy contg. Sn 1.5-10.0, Ni 0.1-10.0, Si 0.1-5.0, and optionally Zn, Fe, Mn, Co, Al .ltoreq.2.5 each, Mg, As, Ca, V, Y, rare earth elements, In, Pb, Sb, Bi, Te, Ag, Au, P, B, Cr, Ga, Ti, Zr, and/or Ge .ltoreq.0.5% (.ltoreq.3.0% as total). The Cu alloy from continuous casting is machined, cold-worked for 20-95% draft, heated at 300-950.degree. for 5 s-24 h in nonoxidizing atm., cooled at 0.01-500.degree./s, pickled and/or machined, cold-worked for 5-90% draft, heated .gtoreq.1 time at 200-650.degree. for 5 s-24 h in nonoxidizing atm. The product shows resp. tensile strength, elongation, and soldered joint strength of 78.1 kg/mm<sup>2</sup>, 10.8%, and 1.0 kg/mm<sup>2</sup> as well as excellent bending workability and paint adhesion.

AN 107:203595 HCA  
TI **High-strength** electric conductor from **copper**  
-base alloy  
IN Shimada, Takashi  
PA Nippon Mining Co., Ltd., Japan  
SO Jpn. Kokai Tokkyo Koho, 3 pp.  
CODEN: JKXXAF  
DT Patent  
LA Japanese  
FAN.CNT 1

	PATENT NO.	KIND	DATE	APPLICATION NO.	DATE
PI	JP 62133050	A2	19870616	JP 1985-270785	19851203

AB For **high-strength** conductors, the **Cu** alloy contains Ti and **Sn** 0.1-5.0 each, and optionally Pb 0.005-0.5 and/or .gtoreq.1 of P, Al, Zn, Ni, Si, Be, Fe, Mn, **Mg**, Cr, Co, Zr, As, Ag, Cd, In, Sb, Te, Ge, and/or Hf 0.05-1.0 for total 0.005-2.0%. The **Cu** alloy is soln.-treated, age-hardened for 10 s to 10 h at 200-700.degree., cold-rolled for .gtoreq.10% redn., and then heat-treated for 10 s to 10 h at 200-700.degree.. Thus, an ingot of **Cu-2 Ti-1.8% Sn** alloy at 800.degree. was hot-rolled into a plate 5 mm thick, and trimmed; heated for 30 min at 800.degree., and quenched in water; aged 1.5 h at 450.degree.; cold-rolled into strip 0.5 mm thick; and heated 3 min at 450.degree.. The strip product showed tensile strength 120 kg/mm<sup>2</sup> and elec. cond. 30% of IACS, and was suitable for precision springs.